

and those on primaries are not nearly so bent as *cecropia*, and on both wings are broader than *cecropia*; outer margin of secondaries of same shade as primaries, not darker as in *cecropia*, the whole insect being slightly below the size of *cecropia*.

Hybrid *C. ceanothi-cecropia*.—This is nearer, to my mind, to *cecropia* than *ceanothi* in size and shape of wings though intermediate in markings, but a lighter colour than either parents. The costa of primaries of *ceanothi* is straight for three-fourths its distance from the base, in the hybrids it is arched all the way as in *cecropia*; the outer margin of the secondaries of *ceanothi* are not rounded as we find in *cecropia*, and in this again the hybrids distinctly take after *cecropia*. The costa of secondaries of *ceanothi* have a dip in them; in *cecropia*, arched; the costa of hybrids, as in their primaries, is arched also. The white bar on the wings of the hybrids, however, conforms much more nearly to *ceanothi*, and the ocellus of both primaries and secondaries is intermediate in shape between their two parents, having the width of *cecropia* and the length of *ceanothi*, in which species, as in the hybrids, the outer point merges into the white bar on the secondaries. The under side of secondaries of *cecropia* has a whitish band commencing at the base, where it is slightly wider, running round the costa and meeting the white band of the outer margin. In *ceanothi* this band is nearly obsolete, but on the costa and a little from the base is a pinkish spot. In the hybrids this spot is dilated into an elliptic or spindle-shaped spot, running to the base of the wing on the one side, and on the other side narrowed out into a mere streak along the costa till it meets marginal band of white, into which it merges.

In conclusion, whilst writing these descriptions, I have thought to make up a list of hybrids occurring in the Bombycidæ, and would like information of any which are known, giving particulars as to which species was used, as male and female parents, sexes of hybrids, and which parent each sex takes after.

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THE WEST INDIAN SPECIES OF *DACTYLOPIUS*.

BY T. D. A. COCKERELL, F.Z.S., F.E.S.

THE genus *Dactylopius*, Signoret, includes the Coccidæ commonly known as mealy-bugs, and consists at present of forty-one known species. Of these, sixteen have been described by Maskell, eleven by Signoret, three each by Bouché and Coquillett, and one each by Linné, Gennadius, Boisduval, Comstock, Douglas, Niedeiski, Newstead, and Lucas. A few

other names have been proposed by different authors, which are now put aside as synonyms.

The West Indian species have never yet been studied, although, in Jamaica, at least, they are fairly numerous. I have up to the present time recognised seven, and doubtless others remain to be discovered.

(1.) *Dactylopius virgatus*, n. sp.

♀.— $4\frac{1}{2}$ mm. long. Very white mealy brown above, except dark purplish grey subdorsal stripes, which are broadly interrupted centrally. Caudal filaments about 2 mm. long; *i. e.*, about half length of body. No obvious lateral appendages. Segmentation distinct. Beneath whitish, legs pale brown. The caudal filaments are rather slender, but not filiform like those of *D. longifilis*. The lateral appendages seem to be represented by long and very fine hairs, which are obvious in the young, but are lost in the adult. Very young individuals are pale yellow. Femur (of adult) about as long as tibia; tibia about three times as long as tarsus. Antennæ with eight joints, —3 and 8 subequal, or 8 a *little* longer; 2 sensibly shorter than 3; 4 rather longer than 5; 5, 6, and 7 about equal.

♂.—Brown. Antennæ brown; all the joints with long hairs,—3 longest, longer than 1 and 2, decidedly longer than last; 4 same length as 6; 5 a very little shorter than 4; 7 decidedly shorter than 6, and slightly shorter than 5; 8 same length as 7; 9 still shorter, but not quite so short as 1; 10 same length as 5. The second joint, which is about as long as 7 or 8, is conspicuously enlarged, much thicker than the joints following.

On a tree in East Street, Kingston, Jamaica, in enormous numbers. The females, with their cast-off skins, covered the whole under surface of the leaves, which turned yellow and dropped off. The leaves are ovate-acuminate, fleshy, entire; stalks reddish, with some long spines, very glutinous.

In June, other specimens were found on a fruit tree. These, boiled in caustic soda, turned madder colour, and stained the liquid claret colour; but apparently this red staining, or most of it, came not from the Coccids, but from a small fruit they were on. Still, the insects themselves were afterwards seen to be bright red. The eggs are minute, elongate, stained pale pinkish after the soda treatment. In one of the individuals of this lot I noticed a knobbed hair on the tibia.

In addition to the form described above, I have found several kinds of *Dactylopius*, which I was at first disposed to regard as distinct species or subspecies; but, after comparing them with *D. virgatus*, I do not think they can be separated, except as mutations or varieties.

(a.) Var. *farinosus*. ♀.—Adult, resembles *virgatus*, but the dorsal bands nearly obsolete; in one example at least they are quite so, the whole dorsal surface being covered by the white powder. Segmentation distinct. The dorsum and sides emit fine hairs, some of them very long, but, as they have no secretion on them, they are inconspicuous. The caudal filaments, about half length of body, or slightly less, are thickly covered with secretion. There are no lateral processes. Length of body, about $\frac{1}{4}$ th inch. The legs and antennæ are pale brown. The female is active. Antennæ with 3rd and 8th joints longest; then 2. Joints 6 and 7 stouter than 5, and 5 stouter than

4; 4 and 3 of equal stoutness. Joints emitting sparse whorls of hairs. Tibia about as long as femur; tarsus not half length of tibia. Tibia emitting several short stiff hairs. Claw with curved clubbed digitules, longer than claw; no tarsal clubbed hairs seen.

On *Prosopis juliflora*. East Street, Kingston, Jamaica. September, 1892. Common on the ends of the twigs, &c.

(b.) Variety. ♀.—Adult, much as in var. *farinosus*; the place of the bands of *virgatus* is indicated by pits or depressions in the secretion, producing two pairs of thoracic and three pairs of abdominal spots or patches on the back, the abdominal patches each emitting a hair. This form is, therefore, intermediate between *farinosus*, in which the dorsal surface is covered with white powder, and *virgatus* proper, in which the secretion is locally absent, so as to give the appearance of bands.

On *Acalypha*, on the leaves. Parade Garden, Kingston, Jamaica.

A specimen measured was $3\frac{1}{2}$ mm. long; with the caudal filaments, 2 mm. long.

(c.) Variety. ♀.—Adult, about 4 mm. long, thickly covered with white mealy substance. Caudal filaments thick, nearly as long as body. Lateral filaments obscure, or none. Legs and antennæ brown. Eye very large, its inferior margin notched.

On sweet sop (*Anona*). Kingston, Jamaica.

This is very like var. *farinosus*, but the caudal filaments are longer. It may be worth while to state that in giving the length of the caudal filaments in this species, the length of the longest filament is quoted. I have noticed that the left filament is sometimes shorter than the right.

(d.) Var. *humilis*. ♀ (not adult).—About 2 mm. long. Caudal filaments white, rather thick with secretion; less than 1 mm. long. Body pale lavender-grey, with the segmentation distinct; a moderate amount of mealy powder, and no dark dorsal line, but some indication of a light one, due to secretion. Legs and antennæ pale brown. No lateral projections, but a few hairs free from secretion, especially close to the caudal filaments, where they are as long, or nearly as long, as the filaments, and about seven in number on each side. Caudal stylus between the filaments distinct, about quarter length of filament. Eyes black and distinct. Antennæ of 8 joints,—3 longer and more slender than 2, but hardly as long as 8; 4 to 7 subequal, and shorter than 2. First joint with a few long hairs; no very long hairs on eighth. Claws with knobbed digitules, the knobs larger. Tarsus with the usual knobbed hairs, but the knobs almost obsolete. Tibia with a row of stout hairs or bristles on inner side, and a row of finer ones externally. Tibia about twice as long as tarsus; and as long as, or even a little longer than, femur. Later on, more fully grown individuals were observed, nearly 4 mm. long. Very young ones are yellowish.

On *Tribulus cistoides*. East Street, Kingston, Jamaica. July, 1892.

At first I thought this was a distinct species, but now I feel sure it is only a form of *virgatus*. On September 29th, I found undoubted *D. virgatus* in great abundance, young and adults, on *Tribulus cistoides*, in East Street. The adults swarmed on the fruits.

(To be continued.)